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H. W. Stewart: The absorption and partial purification of catalase from liver.

Opal Burres: A chemical and physiological study of some enzymes and toxins from *B. pyocyaneus*.

O. C. Stanger: The action of light, of oxidizing and of reducing agents upon a purified catalase.

J. H. Brown: The nature and action of the glycolytic enzyme of autolyzing muscle.

R. D. Glasgow: The extraction and properties of lipase from insects.

Industrial Chemistry: PROFESSOR PARR, DR. MEARS.

Brainerd Mears: Gas calorimeter.

D. L. Weatherhead: Asphalts.

W. F. Wheeler: Weathering of coal.

J. M. Lindgren: Boiler water.

F. W. Bliss: Occluded gases in coal. Determination of water by the phase rule.

T. R. Ernest, W. S. Williams: Sand-lime brick, and artificial silicates.

E. C. Hull: Distillation of coal at low temperatures.

R. F. Hammer: Ammonia from nitrogenous waste.

W. F. Wheeler: Calorimetric studies.

F. W. Kressman: Spontaneous combustion of coal.

Water Survey: PROFESSOR BARTOW.

Softening of the water supply of Champaign and Urbana. Clarification of cistern water. Character of water from shallow wells in cities. Municipal water supplies.

L. I. Birdsall: Action of coagulants on Lake Michigan water.

W. C. Marti: Boiler water treatment.

G. A. Van Brunt: Treatment of water with bleaching powder.

Agricultural Chemistry: PROFESSOR HOPKINS.

L. H. Smith, C. H. Myers: Breeding of corn and other crops to improve the chemical composition.

J. E. Readhimer, W. G. Eckhardt, O. F. Fisher, E. Van Alstine, J. P. Aumer, J. B. Park, Gertrud Niederman: Investigation of factors of fertility for Illinois soils, including work on experiment fields in various parts of the state and also pot experiments.

Robert Stewart: Quantitative relationships of carbon, nitrogen and phosphorus in soils.

L. H. Smith, W. B. Gernert: Transmission of the characters in corn with respect to the chemical composition of the kernel.

SOCIETIES AND ACADEMIES

THE WASHINGTON ACADEMY OF SCIENCES

THE annual meeting of the Washington Academy of Sciences was held at the Cosmos Club, Washington, D. C., on Thursday, January 21, 1909.

President Walcott and about thirty members were present.

After receiving and approving the reports of the secretaries, treasurer and editor for the year just closed, the following officers were elected for the ensuing year:

President—C. D. Walcott.

Vice-presidents:

Anthropological Society—Walter Hough.

Archeological Society—Mitchell Carroll.

Biological Society—T. S. Palmer.

Botanical Society—J. N. Rose.

Chemical Society—H. W. Wiley.

Engineers Society—D. S. Carll.

Entomological Society—A. D. Hopkins.

Foresters Society—Gifford Pinchot.

Geographic Society—Willis L. Moore.

Geological Society—A. H. Brooks.

Historical Society—J. D. Morgan.

Medical Society—E. A. Balloch.

Philosophical Society—C. K. Wead.

Managers—1910: Geo. M. Kober, F. V. Coville, Bailey Willis. 1911: L. O. Howard, O. H. Tittmann, B. W. Evermann. 1912: L. A. Bauer, C. H. Merriam, C. F. Marvin.

At the close of the year the statistics of membership were as follows:

Patrons	7
Honorary members	1
Life members	1
Resident members	173
Non-resident members	157
Total	339

The non-resident members are geographically distributed as follows: California, 18; Canada, 4; Colorado, 1; Connecticut, 10; District of Columbia, 3; England, 1; Illinois, 7; Indiana, 5; Iowa, 2; Maryland, 8; Massachusetts, 24; Michigan, 1; Minnesota, 4; Missouri, 5; Nebraska, 1; New Hampshire, 3; New Jersey, 4; New York, 25; North Carolina, 1; Ohio, 4; Pennsylvania, 13; Philippines, 1; Rhode Island, 2; Tennessee, 1; Texas, 1; Virginia, 3; West Virginia, 1; Wisconsin, 4.

During the year 1908 the academy published Volume X. of its *Proceedings*, which contained 248 pages, 2 plates and 12 figures.

ON the evening of February 1 Professor Albrecht Penck, of Berlin, delivered before the Washington Academy of Sciences an illustrated lecture on "The Antiquity of Man." Professor Penck kindly furnished the following abstract:

"The antiquity of man dates far back beyond all historical record. It is a purely geological question which must be treated by means of geological observation. It has been known for quite a long time that in western Europe man existed during the glacial epoch. The French geologists and anthropologists, however, who maintained this, assumed only one glacial epoch, while we know to-day that the great ice age consisted of different glacial times separated from one another by interglacial times. The traces of the various glacial epochs consist of moraines of different geological and morphological age, and there is a very strong similarity between the Wisconsin, Illinoian and Kansan moraines of North America and the Würm-, Riss- and Mindel-moraines in the circumference of the Alps, and the Günz-moraines which can be compared with the pre-Kansan moraines of North America. The traces of the interglacial periods consist of deposits with a fauna or flora which is not reconcilable with glacial conditions. The glacial conditions are determined by a lowering of the snow-line of three to four thousand feet below the snow-line of to-day as can be shown by the evolution of old glaciers, while there are indications in the Alps, judging from the corresponding flora, that the snow-line of interglacial times lay about one thousand feet higher than to-day.

"The traces of paleolithic man are found generally outside of the morainic deposits of central Europe, but there are some places where we find those traces above the moraines even of the last glacial epoch, of the Würm or Wisconsin. These are the very well-known stations of Magdalénien near Schaffhausen in Switzerland, of the Schweizersbild and the Kessler Loch. Surely man existed here after the retreat of the ice, but the accompanying fauna is still a glacial one. Man existed here just after the maximum of the last glacial epoch. We have abundant evidence of the existence of man during the beginning of the last glacial epoch as indicated by many paleolithic implements found in the loess deposits, especially those of the valley of the Danube and the valley of the Rhine, which all belong to the Solutréen.

"Of the greatest importance is the occurrence of human relics in the cavern of the Wildkirchli on Mt. Säntis in Switzerland. Here Mr. Bächler discovered, at a height of nearly five thousand feet, together with the relics of one thousand cave

bears, several hundred paleolithic instruments of Moustérien type. As we know that the Moustérien is older than the Solutréen and Magdalénien, and since it is quite impossible that man existed here during the glacial epoch, we have to deal here with traces of an interglacial man who had already appeared in the Alps, and this conclusion is corroborated by the fact that the cavern of the Wildkirchli exists in a region which overlooked the old glacier of the Rhine and the local glaciers of the Säntis, so that it was protected against glacial erosion. Probably during the last ice age the whole cavern was filled up with ice, so that the formation of the loam in the cavern ceased and no deposit was forming during the whole glaciation.

"The excavations made by order of the Prince of Monaco in the caverns near Mentone proved indeed that man existed there during the last interglacial epoch, for we find in the Grotto of the Prince beneath the cavern deposits of the glacial fauna, such deposits as an interglacial fauna contain: human skeletons and the implements of the Moustérien type. At other places, especially in France, the Moustérien implements are found together with a glacial fauna. All these localities lie outside of the Riss glaciation, and they are never met with in the realm of the old moraines, as for example, the Magdalénien. We, therefore, must believe that the Moustérien with the cold fauna is contemporaneous with the Riss ice age.

"Quite recently Mr. Hauser has discovered at Le Moustiers a human skeleton, the skull of which is of Neanderthal type, such as has been also found at Spy and Krapina. The recently discovered human jaw of Heidelberg described by Schoetensack belongs evidently to an older interglacial epoch, probably to that very long time between the Mindel and Riss ice ages, where we have also to place the Chelléen implements. Thus we have full evidence that man existed already before the Riss or Illinoian glaciation. Now it can be shown that the time elapsed since the last glaciation is far shorter than the time between the last and the glaciation before the last, between the Würm and Riss ice age. This interglacial time, however, is again far shorter than that long interval between the Mindel and Riss ice age. If, therefore, we have some reasons to believe that the time since the last glaciation was at least twenty thousand years, we must believe that the Heidelberg man dates back about two hundred thousand years.

"Far older are those eoliths found in Belgium and in southeast England. They belong to the early Pleistocene epoch. And indeed we must

expect to find here implements made by early man or his predecessor, but the question is if his predecessor already belongs to the genus *Homo* or to the anthropoid apes. When we discover that the recently extinct natives of Tasmania manufactured eoliths of the same kind as those found in the old Pleistocene gravels of Belgium and England, in the upper Miocene of central France and the upper Oligocene of Belgium, we feel inclined to believe that those implements may not be regarded as *human* artefacts but as having been made by a predecessor of man. Indeed those oldest eoliths occur in a group of anthropoid mammals the genera of which are totally extinct, and it would be very surprising to find that only the genus *Homo* remained unchanged while all other genera developed."

Dr. Merriam remarked upon the Moustérien skull, suggesting that it appeared to be the skull of a child; and called attention to the remarkable differences between the Heidelberg jaw and that of man to-day, a difference so great as to indicate that the Heidelberg jaw may not belong to the genus *Homo*.

Mr. Willis inquired for the evidence that the eoliths found in Tertiary formations were actually shaped by hand and Professor Penck responded by pointing out their peculiar form, one part being shaped as if to hold in the hand and the other part a sharp edge or series of points for cutting. Such eoliths have been found dulled, as if used by man or his ancestor.

Dr. Hough remarked that as man is the only animal that has ever used fire, he desired to know whether or not traces of fire had been found at the various European localities with the other evidences of man, and Dr. Penck replied that traces of fire were found constantly with other evidences as far back as the Moustérien skeleton. No trace of fire was found with the Chelléen implements because they are alluvial and none could be preserved in such deposits.

Dr. Frank Baker called attention to the controversy that had arisen regarding certain prehistoric remains, particularly the jaw of La Nautette. It had been held that the eminences for attachment of the muscles of the tongue upon that jaw were so slight as to indicate that the animal to which the jaw belonged resembled apes in lacking the faculty of speech. Judging from the figures of the Heidelberg jaw displayed on the screen, these eminences were particularly well marked in that specimen, which would argue a special use of the tongue either for speech or for some allied function.

Mr. Spillman referred to the teeth of the Moustérien skull as being like those of a child.

J. S. DILLER,
Recording Secretary

THE AMERICAN CHEMICAL SOCIETY
NEW YORK SECTION

THE fifth regular meeting of the session of 1908-9 was held at the Chemists' Club on February 5.

The chairman, Dr. L. H. Baekeland, presented the results of an investigation which has occupied his attention for some years under the title, "Bakelite: its Synthesis, Constitution and Industrial Application."

Bakelite is a polymer of an oxybenzoyl-alcohol-methylene-glycol-anhydride having the formula $n(C_{15}H_{13}O_7)$. It is produced by the condensation of seven molecules of a phenolic body with one of formaldehyde. The pure substance is a hard, odorless, transparent mass resembling amber. It is insoluble in all solvents and extremely inert, resisting the action of strong chemicals and high temperatures. In its final form, Bakelite is not a plastic and would have few uses had it not been found possible to control the reaction by which it is formed and prepare intermediate condensation products. These may be incorporated with filling materials such as asbestos and wood pulp, molded into useful forms and finally hardened by the combined action of heat and pressure. The uses of Bakelite are being studied in more than forty different industries with excellent results; for example, in electricity it may be used for insulating devices and impregnating the coils of dynamos; in mechanics for bearings; in chemistry for lining wooden and metal tanks and protecting apparatus; in manufactures for making pool balls, pipe bits and buttons.

Dr. Baekeland's paper will appear later in full in the *Journal of Industrial and Engineering Chemistry*.

The other papers presented were:

M. A. Rosanoff, A. B. Lamb and F. E. Breithut: "A New Method of Determining the Partial Vapor Pressure of Binary Mixtures."

D. D. Jackson and W. A. Horton: "Experiments on the Putrescibility Test for Sewage and Sewage Effluents."

S. A. Tucker, W. A. Alexander and H. K. Hudson: "The Relative Efficiency of the Arc and Resistance Furnace for the Manufacture of Calcium Carbide."

C. M. JOYCE,
Secretary